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FEDERAL-STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Rio Grande Drainage Basin

Ву

Division of Irrigation, Soil Conservation Service United States Department of Agriculture Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.



As of APR. 1, 1950



WATER SUPPLY OUTLOOK

RIO GRANDE AND CAMADIAN DRAINAGE BASINS

April 1, 1950

The water supply outlook for the Rio Grande and its tributaries in San Luis Valley is slightly less than normal and much less favorable than a year ago. To the north of the upper Rio Grande and along the Sangre de Cristo Range the snow cover is definitely low. There is no snow in the valley. On Northern New Mexico tributaries the snow cover decreased during March and on many snow courses the snow is less than for any April 1 since measurements were started in 1937. Soil moisture is deficient throughout the watershed.

RIO GRANDE

At Wolf Creek Pass and for a short distance north and south along the Continental Divide snow cover is near average. Elsewhere on the mountains surrounding San Luis Valley the snow cover ranges down to about one-half of normal. The summer flow of the Rio Grande, Alamosa and Conejos Rivers at the rim of the valley will be near average but the flow of other streams will be much less. Soil moisture conditions in the valley are dry. Carryover storage in irrigation reservoirs is well above last year and the past ten year average.

On the headwaters of the Rio Chama snow cover is only 68 percent of normal and 56 percent of last year at this time. On the Sangre de Cristo range to the east of the river snow cover is very light, about 25 to 30 percent of the April 1 average. The snow-melt season flow of these streams will be much less than normal. Soil moisture conditions are reported as poor in the middle Rio Grande irrigated area. Storage in El Vado reservoir is down to 22,000 acre-feet.

The combined storage of Elephant Butte and Caballo reservoirs is now 830,000 acre-feet, about 200,000 acre feet above a year ago. With the current runoff prospects in the Rio Grande there will be considerable decline in storage during the next year. Soil moisture conditions are dry in the lower valley.

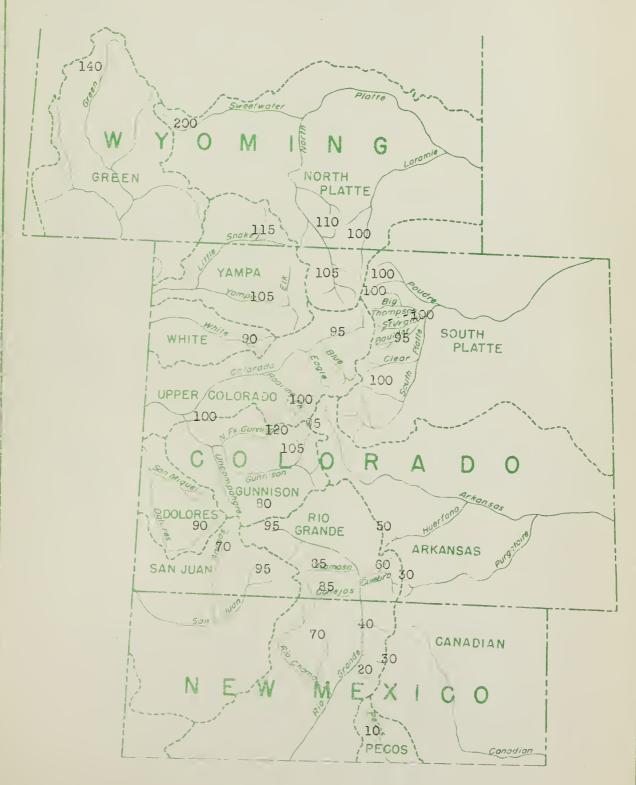
There is practically no snow on the headwaters of the Pecos. Storage in Alamogordo and McMillan reservoirs now totals 117,000 acre-fect which is much above average. Soil moisture conditions on the Carlsbad project are poor,

CANADIAN

Snow cover on the Canadian River tributaries is the lowest for April 1 for many years. Conchas reservoir has in storage 308,000 acre feet as compared to 306,000 a year ago. On the Tucumcari project soil moisture and crop conditions are described as fair.

Miscellaneous Series Paper No. 462, Colorado Agricultural Experiment Station

WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH In Percent of Normal April 1, 1950





RIO GRANDE DRAINAGE BASINS

STREAM FLOW FORECASTS, April 1, 1950

		April-Se	nt. Incl., Stre	April-Sept. Incl., Streamflow, Acre Feet	
	Forecast 1950	9491	Measured Kunoff	r 1947	10-year Avg. 1939-1948
RIO GRANDE					
South Fork at South Fork	. 130,000		192,000	104,000	130,000
Rio Grande at Del Norte	500,000	332,000	823,000	530,000	565,000
Alamosa above Terrace Res.	75,000		100,000	68,300	74,000
Conejos at Mogote	210,000	268,000	262,000	176,000	211,000
Culebra at San Luis	20,000		36,000	35,000	37,000
Rio Chama at Park View	160,000	319,010	222,000	17,8,000	214,000
Costilla at Costilla	20,000	78,000	35,000	27,000	1,0,000
Toas at Los Cordovas	15,000		29,000	21,000	777
Embudo Creek at Dixon	25,000		65,000	27,000	63,000
Rio Grande at Otowi Bridge	7,000,000*	948,000	987,000	422,000	867,000
Rio Grande at San Marcial	150,000*		727,000	130,000	639,000
Pecos at Pecos	25,000	78,000	70,000	38,000	70,000

^{*} Including change in storage in El Vado Res.

SNOW SURVEYS AND IRRIGATION VATER FORECASTS RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, APRIL 1, 1950

		USABLE CAPACITY		THOUSANDS OF		ACRE FEET	IN STORAGE
STREAM	RESERVOIR			About April 1	pril l		10-year Ave.*
		1000 W.F.	1950	1949	1948	1947	1939-1948
RIO GRANDE							
	Rio Grande	45.8	30.6	19.5	24.2	6.9	18.1
	Santa Maria	45.0	22.9	15.8	5.7	м. М.	6.6
	Sanchez	103.0	13.0	6.2	9.2	6.7	15.9
	Terrace	17.7	4.4	2.2	6.0	3.6	4.1
	Continental		19.0	0.9	1	1,2	7.4
	=lephant Butte		656.1	530,0	394.1	512,3	1063.3
	Caballo		221.3	158.9	171.5	262.8	200.0
CHIMIA RIVER							
	El Vado	226.0	22.0	19,0	26.8	0،14	58.2
CANADIAN RIVER							
	Conchas	0.009		306.5	371.0	364.9	253.4
PECOS RIVER							
	ilamogordo Wckillan-walon	148.0	102.7		35.6	35.6	60.9
*Some for shorter periods	ods	phone in					

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for RIO GRANDE BASIN April 1, 1950

SUMMARY OF APRIL 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

	Snow Depth)epth	Water	Water Content	Number	Snow Density	ensity	195	1950 Water Content	ontent
	Fourteen		Fourteen		Courses	fourteen			in percent of	t of
WA TERSHEDS	year	1949 1950	year	1949 1950	in	year	1949	1950 Fou	ourteen Yr	
	Avg. *		Avg. *		Average	Avg. *			. Avg. *	1949
	In.	In. In.	In.	In. In.		Percent	Percent	Percent		
Rio Grande (Colo.)	38.1	48.9 28.3	12.4	16.1 10.1	10	33	33	36	82	63
Upper Rio Grande	38.5	60.8 36.5	14.0	21,3 13.5	Υ	36	35	37	96	63
Alamosa River	14,7	57.9 31.0	13.5	0	~	30	35	37	85	28
Conejos River	46.2	50.3 40.1	16,2	16.7 13.6	2	35	33	34	84	81
Culebra River	36.9	50.1 18.6	11,2	13.0 6.3		30	56	34	56	8†
Rio Grande (N.M.)	23.6	27.9 9.5	7.9	8,9 3,2	13	33	32	34	다	36
Chama River	36.8	44.8 26,2	13.2	16.0 9.0	N	36	36	34	89	56
Pecos River	13,0	10,3 1,5	4,1	3.1 0.4	~	32	30	27	10	13
Canadian River	22,9	26.4 6.1	7.1	7.7 2.1	7	31	29	34	30	27
*Some for shorter periods	riods									

DATA* PRECIPITATION

		Precipitation	Departure	Precipitation	Departure
WATERSHED	STATE	October 1 to	from		from
		Warch 31	Normal	March	Normal
		Inches	Inchos	Inches	Inches
Canadian	New Mexico	1,08	-3.08	0.0	92 0-
Rio Grande	Colorado	4.09	3.6) <u></u>	
Rio Grande (N)	New Mexico	7.00	15	t m	1000
Rio Grande (S)	New Mexico	7.00	-1.73) C	33.01
Pecos	New Menico	1.63	-3.24		10.73

*Avorage of Selected High Elevation Stations

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RIO GRANDE DRAINAGE SNOW SURVEYS April 1, 1950

ents	Past Record	1	tent(Inches)		30.6	8,9	6.2	7.4	8.4	20.8	25.0	9.4	11,2	3.1	!		1	1	\	1	!		12.4		30.6	æ • • • • • • • • • • • • • • • • • • •	7.6	!	!	1	1	
easurements		P	Rec								177				<u></u> —	Н	٦			П	<u></u>	Н			17			Т_	П			-
Cover mea	Inches)		1948		39,3	14.3	10,3	9.7	14.6	1	21,6	0 8	13,7	٠ ٥	!	1		!	1	1	!		15.2		39.3	14.3	<u>၀</u> ထံ		·			20,5
Snow Co			1949		42.3	11.9	10,4	10,6	9.4	29.5	22.7	9.6	13.0	1,9	28,3	15.9	28.9	17.2	18.8	12.4	14,5	က္က	16,1		42.3	11.9	9.6	17.2	18.8	12.4	14.5	درد
-	Water		1950		31.2	6.2	2,2	7.0	4.2	20°8	20.1	3,1	6.3	0	18.4	0,5	21,1	2,6	8.2	3.0	2.9	3.0	10,1		31.2	6.2	3.1	7.6	8.2	9,0	1 2.9	73.5
2	Snow	Depth	(Inches)		78,3	20.3	0.9	19.9	12.8	56.0	60.3	10,8	18.6	0	149.0	0,0	53.8	26.0	23.0	11,0	10.0	14.2	28.3		78.3	20.3	10.8	26.0	28.0	11.0	10.0	37 E
1 67 17	Date	of	Survey						3/28			1/1/		0 4/2			3/31	0 4/2	0 4/3	0 4/3	0 4/3	3/31	age		3/31			6/1/3				0.0
7 10 8		Elev.			10000	9350	096	9300	9300	11500	10000	9700	10000	8200	995(9450	10100	10300	10900	10000	9300	10000	drainag		10000	935(970(10300	10900	10000	9300	במינמת ל
		h'an ge			SE	Pin Pin	五三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三	至9	70W	4压	五	No.	105,2W	72W	MT	当	5 王	S	3W	2臣	1E	3 至	ge for		2 区	門	SE	No.	314	2E]E	ر: د
		Twp.			37N	Not	36N	33N	288	37N	32N	NT7	37.2N	29N	36N	35N	32N	NT7	L2N	NT	NOT/	15N	Avera	and reserve	37N	NOT/	LIN	NTY	L2N	NTH	HON	ATTORDED
Toration	2	Sec.			7	13	75	25	22	30	17	∞		13	22	25	24	56	2	13	32	12			=	H3	ω	56	2	19	32	
L	No.	and	State	COLORADO	26 Colo.	27 "	" 7 ^t 7	67	77 "	n 92	11 22	11 08	82 "	n 48	108 "	109 "	110 "	122 "	123 #	124 "	125 "	126 "			26 Colo.	27 "	08	122 "	123 "	124 "	125 "	
	Drainage Basin		Snow Course	RIO GRANDE IN COLC	Wolf Creek Pass	Upper Rio Grande	Silv er Lakes	River Springs	LaVeta Pass #2		Cumbres Pass #2	Santa Maria	Culebra	Ft, Garland	Platoro	West Conejos	La Langa	Pyramid	Spr. Creek Pass	Pool Table Mt.	Lake Humphreys	Cochetopa Pass		UPPER RIO GRANDE	Wolf Creek Pass	Upper Rio Grande	Santa Maria	Pyramid	Spr. Creek Pass	Pool Table Et.	Lake Humphreys	,

RIO GRANDE DRAINAGE SNOW SURVEYS
April 1, 1950

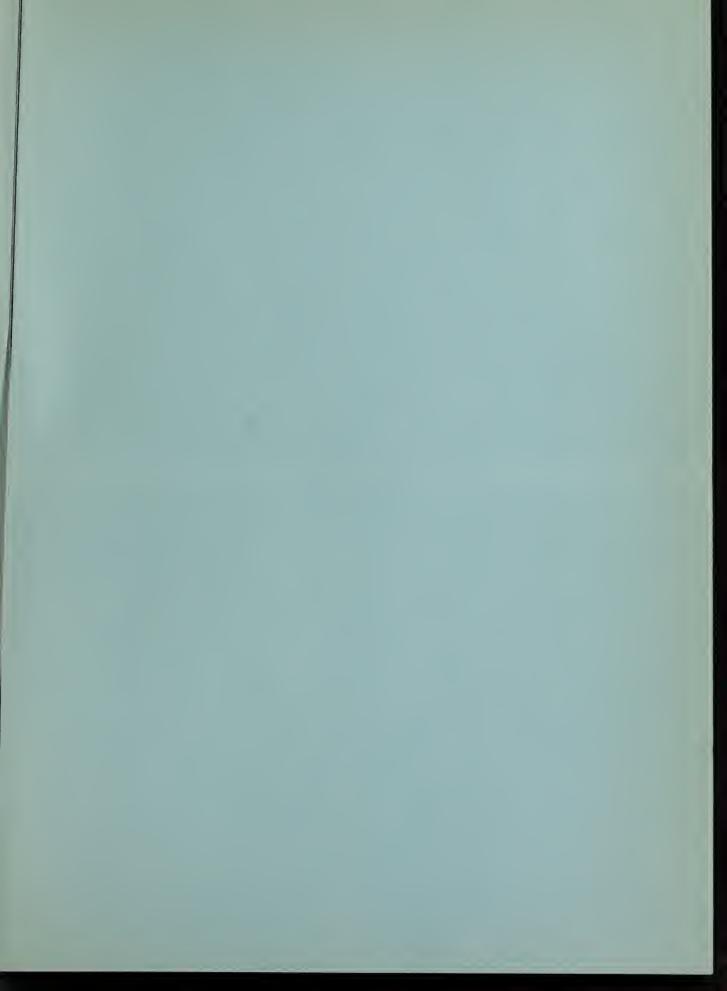
		Location	tion				-	Sn	Snow Cover	: Weasurements	ements	
Drainage Basin	No.					Date	Snow	Water C	Water Content (Inches)	Past	, Record
	and	Sec.	Twp.	Range Elev.	Elev.	Of	Depth				14-1	Av. Water Con-
Snow Course	State		1			Survey		1950	1949	1948	Rec.	tent(Inches)
ALAMOSA RIVER										(((
Silver Lakes	47 Colo.	15	36N	公田	0096	3/31	0.9	2.2	10,4	10.3	13	6.2
Summitville	n 92	30	37N i		11500	14/3	56,0	20,8	29°5	1	10	20.8
			Average	for dre	drainage		31.0	11,5	19.9	10,3		13.5
CONEJOS RIVER									,			-
River Springs	49 Colos	25	33N	<u></u> 핑	9300	3/30	19.9	7.0	10,6	2.5	73	7.4
Cumbres Pass #2	77 "	17	32N	公田	10000	3/30	60,3	20.1	22,7	21,6	14	25.0
Platoro	108 "	22	36N		9950	17	0.61	18,4	28.3		_	i i
West Conejos	109 "	25	35N	띄	9450	14/3	0.8	3.0	15.9	!	Н	1
L,a Manga	110 "	24	32N i	四田	10100	3/31	53.8	21.1	28.9	}		1
)			Average	for dra	drainage,		1.01	13.6	16.7	15,7		16.2
CULEBRA RIVER)					(((
Culebra	82 Colo.		37.2N	105.2W	10000	1/1	18.6	6.3	13.0	13.7	01	11.2
						OC FAG						
			15 OTH -	GRANDE IN	NEW MEAN CO	22 7						
LVER	į						((1
Cumbres Pass #2	77 Colo.	17	32N	五,	10000	3/30	200	20.1	22.7	2T,0	T/†	25.0
Canjilon	6 N.M.	7	26N		9500	1/1	30,1	10.4	14.0	15.1	7	T. 9
Pay Kole	15.		28N		9700	1/1	21,2	7.1	14:8	15,1	01	10.0
Chama Divide	17 "		36,9N	106, 7W	7750	3/31	0	0	13,2	ν. (1,	70	m,
Chamita	18 "		36.9N	106.7W		3/31	19,5	7,3	15.1	12.6	∞	7.6
Bateman	29 "	N	26N	(E	9300	1/1	35,3	12.8	1	1	1	***
			Average	for dra	ainage		26.2	0.6	16.0	13,9		13.2
PECOS RIVER												
Aspen Grove*	L N.M.	8	28N 1	15E	9500	3/31	2,1	9.0	1,8	7.3	13	3.7
Panchuela #2	20 "	25	24N	16E	9 200 i	3/31	0	0	2.4	7,8	23	2.2
Big Tesuque*	21 "	23	22N	13E	9000	3/31	2.4	9,0	5.2	10.7	∞	6.4
Gallinas	25 "	22	22N	13E	10100	3/29	0	0	1,2	3.9	2	2.6
		A	Average	for drainage	nage	-	7.5	7.0	3.1	7.6		7-7-
*On adjacent drainage	nage											

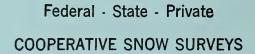
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-/RIO GRANDE DRAINAGE SNOW SURVEYS
April 1, 1950

			Too sting						Snor	Show Cover egaments	พอสเเลยอ	ents
,		7	COCACTO	11				i	0110		Cacar Car	- 1
Urainage dasin	No.					Date	Snow	water (Content	Inchesy		Past Record
and	and	Sec	Twp	Range	Elev.	of	Depth				Mrs. of	IV Water Content
Snow Course	State			1		Survey	(Inches)	1950	1949	1948	Record	(Inches)
					RIO GRA		NEW MEXI	20				
Red River	1 N.M.	29	28N	15压	9500	1/7	10,4	ب بئ	8,9	0°6	13	జ జ
Taos Canyon	2 "	10	25N	15E	0006		8,7	2.8	3,7	6°6		7.6
Aspen Grove	, t	12		10E	9100	3/31	2.1	9°0	1,8	7:3	<u>n</u>	3.7
Lee Ranch	<u>=</u>	m	18N	<u>刊</u>	9050		ۍ ۳	L, T	6°6	13.4	7	8,0
Canjilon	= 9	77		(死	1 9500 1		30.1	10,4	14.0	15.1	13	17.9
Hematite Park*	= 6	<u></u>		15E	9500 1		0	0	5.7	2.5	7	5.7
Tres Ritos	12 "	23		13표	0006	3/29	9.0	0°2	7.1	9.3	12	٧٠.
Pay Role	15 =	16	-	7正	9700		21.2	7,1	14.8	15.1	10	10.0
Chama Divide	17 "		36.9N	106,7W	7750		0	0	13.2	2,5	10	œ ش
Chamita	18 "	1		106.7mj	8500		19.5	7.3	15,1	12,6	∞	9.4
Cordova	19 "	2	parties of the last	13표	10100	3/29	22.9	7,8	14.2	15.2	ω	13.2
Panchuela #2	20 "	27 ;		12压	8300		0	0	2.4	4.8	<u> </u>	2,2
Big Tesuque	27 "	17	18N	11E	100001		2.4	9.0	5.2	10,7	<u></u>	7.9
Elk Cabin	24 "	∞	18N	11E	8250		0	0	2,2	0°0	~	1.1
Rio En Medio	26 "	∞	18N	11 E	10000	3/31	7,6	2.2	1	1	1	1
Baca	27 "	33	24N	SE SE	0006	3/31	8,1	2,5	-	1	1	!
Quemazon	28 "	34	20N	了 可	9500	3/31	15.9	بر در	!	1	1	1
Bateman	29 "	7	26N	到	9300 1	1/7	35,3	12.8		1	1	: :
			Average	for dra	ainage		9.5	3.2	8.9	10.6		7.9
					C.S.	CANADIAN	RIVER					
Hematite Park	9 N. M.	∞	28N	15E	9500		0	0	5.7	ر در در	13	5.7
Ocate Mesa	10 "	25	24N	16E	9200 1	1/1	ω Ο	0.3	œ κ	7.9	12	0°.
Tres Ritos*	12 "	23	22N	13年	0006		9,0	0 0	7.7	ر س ر	75	0, 1
Cordova*	: 6T	22		\sim	10101	3/59	22.9	000	774.2	15.2	Ω	7°5
		व	werage	for drai	drainage		6.1	Z. T	() (TO°>		٦.

*On adjacent drainage





Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"